

REMARKS

The June 2, 2003 Official Action and references cited therein have been carefully reviewed. In light of the amendments presented herewith and the following remarks, favorable reconsideration and allowance of the application are respectfully requested.

At the outset, Applicants note that the previous objection to claims 1, 7, and 16; rejection of claims 1, 4, 5, 7, 10, 12, 13, 15, and 16 under 35 U.S.C. §112, second paragraph; and the rejection of claims 1, 4, 5, 7, 10-13, 15, and 16 under 35 U.S.C. §112, first paragraph for allegedly lack of written description, have been withdrawn in view of previous claim amendments and arguments.

At pages 2 and 3 of the Official Action, the Examiner maintains the objection to claim 11 for allegedly failing to further limit the claim from which it depends, and the rejection of claim 11 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. Applicants submit that the cancellation of claim 11 by the foregoing amendment renders this objection and rejection moot.

At page 3, the Examiner has maintained the rejection of claims 1, 4, 5, 7, 10, 11, 13, 15, 16 and further rejected claims 18 and 19 for allegedly failing to comply with the enablement requirement under 35 U.S.C. §112, first paragraph.

Finally, at page 5, the Examiner has maintained the rejection of claims 1, 4, 5, 7, 10, 11, 13, 15, 16 and further rejected claims 18 and 19 under 35 U.S.C. §103(a) as being unpatentable over Seo et al. in view of Sanger et al., Gatz et al., Enyedi et al., Yu et al., and He et al.

The foregoing constitutes the entirety of the objections and rejections raised in the June 2, 2003 Official Action. In light of the present claim amendments and the following remarks, each of the above-noted rejections under 35 U.S.C. §§

112, first and second paragraphs, and 103(a) is respectfully traversed.

**CLAIMS 1, 4, 5, 7, 10, 13, 15, 16, 18, AND 19 FULLY COMPLY
WITH THE ENABLEMENT REQUIREMENT SET FORTH
IN 35 U.S.C. §112, FIRST PARAGRAPH**

The Examiner asserts that Zhang et al. (Plant Cell (2001) 13:1877-1889) teach that overexpressed WIPK in transgenic plants is not active. The Examiner then contends that the claimed invention is not enabled because it is unclear how WIPK alone could confer enhanced disease resistance to a plant, if overexpressed WIPK is not active in a plant. Applicants respectfully disagree with the Examiner's reasoning.

The Examiner contends that it is "not clear how an overexpressed product can contribute to anything if it is inactive." Applicants respectfully submit the Examiner is confusing the mere expression of a protein and the activation of the protein. As indicated in the specification at page 32, line 28 through page 33, line 14, Applicants set forth that the activation of WIPK upon pathogen infection is preceded by "transcriptional activation and *de novo* synthesis of WIPK protein." Applicants reiterate this fact at page 20, line 29 through page 21, line 21 of the specification, noting that "after an appropriate signal (e.g., TMV infection) is perceived [by a plant], the WIPK gene must first be transcribed and translated before the protein can be activated." Furthermore, the requirement for transcription and translation prior to activation results in a delay between the signal event, e.g., pathogen infection, and the appearance of WIPK activity (see page 20, line 35 through page 21, line 4). The transgenic plants of the present invention, however, have this delay shortened by producing a large pool of "inactive, but activatable WIPK." This large pool of

inactive, but activatable WIPK at the "mRNA and protein levels will not necessarily stimulate the defense pathway in which WIPK is a critical component" (page 21, lines 5 through 8), but can be "rapidly activated by the appropriate trigger" and confer enhanced disease resistance to these plants. An appropriate trigger includes an infection by a pathogen.

Returning to the teachings of Zhang et al., WIPK was simply overexpressed in the tobacco leaves and then studied for expression level and activity (see Figure 4A). Notably, the tobacco leaves were not subjected to an "appropriate trigger" and, therefore, the WIPK that accumulated was not activated, as predicted in the instant application. Indeed, as seen in Example I of the instant application, TMV-infected, but not mock-infected, plants possessed activated WIPK (page 32, lines 14 through 27). Thus, Applicants submit that the inactivity of the overexpressed WIPK in plants as reported by Zhang et al. and the instant claimed invention are easily reconcilable.

The Examiner has also asserted that the "plethora of MAPKKs [that activate WIPK] are apparently not present in the plants overexpressing WIPK" in Zhang et al. Applicants respectfully submit a skilled artisan would readily appreciate that not all MAPKKs are active under all conditions and, therefore, Examiner's assertion is unsubstantiated. Zhang et al. note, at page 1880, right column, that "MAPKKs that can activate only ... WIPK" may exist, as opposed to a single MAPKK to activate both SIPK and WIPK pathways. Applicants also contend that MAPKKs may only be activated upon an "appropriate trigger." Indeed, Zhang et al. note that MAPKs can be activated "under different conditions" (see page 1880, right column) and cite Widmann et al. (1999, *Physiol. Rev.*, 79:143-180). Notably, Widman et al. indicate that "plant MAPK pathways mediate many different aspects of plant physiology" and that there is likely a "high degree of conservation"

between plant MAPK pathways and mammalian MAPK pathways, which are known to mediate various stress signals through various MAPK pathways (page 169, left column). Inasmuch as Zhang et al. failed to treat the plants with an "appropriate trigger," Applicants conclude that a skilled artisan could not conclude from the teachings of Zhang et al. that MAPKKs capable of activating WIPK are not present in the plants employed by Zhang et al.

In light of all of the foregoing, Applicants contend that the instant application meets the enablement requirements under 35 U.S.C. §112, first paragraph and respectfully request the withdrawal of the rejection to claims 1, 4, 5, 7, 10, 13, 15, 16, 18, and 19 under 35 U.S.C. §112, first paragraph.

CLAIMS 1, 4, 5, 7, 10, 13, 15, 16, 18, AND 19 ARE NOT UNPATENTABLE OVER SEO ET AL. IN VIEW OF SANGER ET AL, GATZ ET AL., ENYEDI ET AL., YU ET AL., AND HE ET AL.

The Examiner has maintained the position that Seo et al. teach transgenic plants, homozygous for the N gene, produced by transforming plants with the nucleotide sequence of Genbank D61377. The Examiner also asserts that although Seo et al. fail to teach the FMV promoter or an inducible promoter, it does not teach away from replacing the promoter with the FMV 34S promoter taught by Sanger et al. or an inducible promoter as taught by Gatz et al. The Examiner further contends that the combined teaching of Seo et al., Sanger et al., Gatz et al., Enyedi et al., Yu et al., and He et al. demonstrates why disease resistance in these transgenic plants are obvious. Applicants traverse.

Applicants respectfully submit that to establish a *prima facie* case of obviousness, three basic criteria must be met: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference

or to combine reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art reference (or references when combined) must teach or suggest all the claimed limitations (MPEP §2143).

Applicants maintain that, contrary to the Examiner's assertions, there is no motivation to combine the references to create WIPK transgenic plants having enhanced disease resistance. Applicants have previously argued that Seo et al. are "silent as to whether the enzyme is pathogen induced." The Examiner has refuted this argument by stating that the "claims do not indicate that SEQ ID NO: 1 is to be induced by pathogens." Applicants respectfully submit, however, that while the claims do not explicitly state that SEQ ID NO: 1 is to be induced by the pathogen, the claims do explicitly recite the pathogens to which the transgenic plant has enhanced resistance. Notably, wounding, i.e. mechanical wounding as set forth in Seo et al. (see page 1988), is not among this list of pathogens thereby meeting the requirement that the "evidence of nonobviousness should be commensurate with the scope of the claims" as set forth by the Examiner.

The Examiner has also contested the Applicants argument that Seo et al. fail to make the connection between WIPK expression and enhanced pathogen resistance. Specifically, the Examiner cites Seo et al., at page 1990, that the proteins induced after the wounding of the transgenic plant are those that are "normally induced by pathogen attack." Applicants strongly disagree with the Examiner's extrapolation of this statement. Seo et al. have only demonstrated that upon receiving a mechanical wound, a transgenic plant exhibits increased levels of salicylic acid (SA) and pathogenesis-related (PR) proteins, which the Examiner alleges are taught by Enyedi et al., Yu et al., and He et al. to be part of the defense of pathogen infections. Seo et al. never demonstrate that their transgenic plants exhibit increased expression of

SA and/or PR proteins in response to pathogen infection. Applicants further contend that neither Seo et al. nor any of the other references cited by the Examiner suggest that the MAPK cascade initiated by a mechanical wound would be the same as the MAPK cascade initiated by pathogen attack. Inasmuch as the extracellular stimuli are different, it follows that the intracellular cascade would be different (see above). Thus, Applicants argue that absent any teaching, the results presented by Seo et al., at most, provide speculation and an invitation for further experiments. Applicants conclude that a skilled artisan would have no expectation, based on the teaching of Seo et al. in view of the other cited references, that a WIPK transgene would provide disease resistance to transgenic plants.

Moreover, Applicants contend that the teachings of Seo et al., in fact, teach away from the claimed invention. Specifically, Seo et al. note, at page 1990, left column, that the WIPK activity, as judged by phosphorylation of MBP, of wounded transgenic plants was less than half of wounded wild-type plants. Inasmuch as the instant claimed invention involves increasing WIPK for rapid activation, it is unclear to Applicants how demonstrating that a decrease in WIPK activity leads to a particular result as in Seo et al., would lead a skilled artisan to the conclusion that increasing the expression of WIPK would enhance the particular result.

In summary, the requirements to establish a *prima facie* case of obviousness have not been met. The references relied upon by the Examiner do not teach or suggest the present invention and therefore they do not provide any reasonable expectation of success of the present invention either. These references also fail to teach or suggest each and every element of the present claims. Applicants, therefore, respectfully submit that the rejection of claims 1, 4, 5, 7,

10, 13, 15, 16, 18, and 19 under 35 U.S.C. §103(a) is untenable and should be withdrawn.

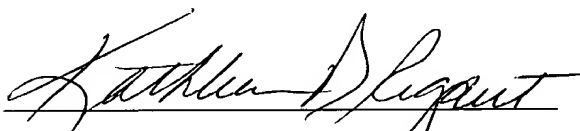
CONCLUSION

It is respectfully requested that the amendments presented herewith be entered in this application, since the amendments are primarily formal, rather than substantive in nature. This amendment is believed to clearly place the pending claims in condition for allowance. In any event, the claims as presently amended are believed to eliminate certain issues and better define other issues which would be raised on appeal, should an appeal be necessary in this case.

In the event the Examiner is not persuaded as to the allowability of any claim, and it appears that any outstanding issues may be resolved through a telephone interview, the Examiner is requested to telephone the undersigned attorney at the phone number give below.

Respectfully submitted,
DANN, DORFMAN, HERRELL AND SKILLMAN
A Professional Corporation

By



Kathleen D. Rigaut, Ph.D., J.D.

PTO Registration No. 43,047

Telephone: (215) 563-4100

Facsimile: (215) 563-4044